

REMARKS

In response to the Final Office Action mailed December 13, 2006, and the Advisory Action mailed March 5, 2007, Applicants submit the present amendment, and a concurrent Request for Continued Examination.

Claims 26, 27, and 43 have been amended. Claim 42 has been canceled, and new claims 61-66 have been added. Claims 53-58 have been canceled as being directed to a non-elected invention. Accordingly, claims 26-28, 31-37, 40-41, 43-44, 59-66 are pending.

There are three independent claims now pending. As amended, independent claims 26 and 43 cover light source elements and liquid crystal displays, respectively, that include "a light source positioned in front of the light entry face," where the light source is "a semiconductor light-emitting diode." Claims 26 and 43 also require that "the light source and the surface opposite the light exit surface are substantially coplanar." The amendments to claims 26 and 43 are supported by the originally-filed application at, for example, page 4, lines 16-21, and Figure 3.

New independent claim 63 covers light source elements that include "a light source positioned in front of the light entry face," where the light source is "a semiconductor light-emitting diode." Claim 63 further requires that "the light exit face and the surface opposite the light exit face are substantially parallel." Support for new claim 63 is found in the originally-filed application at, for example, page 9, lines 14-15, and Figures 2 and 3.

New claims 61 and 62 each depend from claim 26. Claim 61 covers light source elements where "at least one of the light exit face and the opposite surface of the light waveguide comprise light-scattering sections and plane sections, and an area ratio of the plane sections to the light-scattering sections along the light waveguide is set such that a uniform luminance of the light source element is achieved." This limitation was previously included in claim 26, but has been removed from claim 26 in the present amendment. Claim 62 covers light source elements where "the light exit face and the surface opposite the light exit face are substantially parallel." Support for new claim 62 is found in the originally-filed application at, for example, page 9, lines 14-15, and Figures 2 and 3.

New claim 64 depends from new independent claim 63, and covers light source elements where “the light source and the surface opposite the light exit surface are substantially coplanar.” Support for new claim 64 is found in the originally-filed application at, for example, page 4, lines 16-21, and Figure 3.

New claims 65 and 66 each depend from claim 43. Claim 65 covers liquid crystal displays that include a light waveguide where “at least one of the light exit face and the opposite surface of the light waveguide comprise light-scattering sections and plane sections, and an area ratio of the plane sections to the light-scattering sections along the light waveguide is set such that a uniform luminance of the light source element is achieved.” This limitation was previously include in claim 43, but has been removed from claim 43 in the present amendment. Claim 66 covers liquid crystal displays that include a light source, where “the light source and the surface opposite the light exit surface are substantially coplanar.” Support for claim 66 is found in the originally-filed application at, for example, page 4, lines 16-21, and Figure 3.

In the Final Office Action mailed December 13, 2006, independent claims 26 and 43 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Kalmanash (U.S. Patent No. 5,211,463, “Kalmanash”) in view of Tatsuaki et al. (European Patent No. 0 798 507, “Tatsuaki”). Following the present claim amendments, independent claims 26, 43, and 63 cover light source elements and liquid crystal displays that include “a light source positioned in front of the light entry face,” where the light source is “a semiconductor light-emitting diode.” Neither Kalmanash nor Tatsuaki, alone or in combination, discloses the claimed light source elements and liquid crystal displays, at least because neither Kalmanash nor Tatsuaki discloses semiconductor light-emitting diode light sources.

With respect to his display backlights, Kalmanash discloses the use of a “high brightness fluorescent backlight” (Kalmanash, col. 5, line 19) as his light source. Kalmanash points out that “[o]ne advantage of fluorescent lamps for both day and night viewing is the broad color gamut that can be tailored by judicious selection of the phosphor components” (id., col. 6, lines 14-17). With respect to Figures 6 and 7 of Kalmanash, to which the Examiner expressly referred in the Office Action, light sources 102 “include both day viewing lamps and night viewing lamps” (id., col. 7, lines 19-20). Kalmanash does not disclose that light sources 102 can be light-emitting diodes. In fact, based upon Kalmanash’s earlier disclosure, light sources 102 are likely to be

tubular fluorescent lamps, particularly in view of the shapes of surfaces 100 and the extent of block 86. That is, based upon Kalmanash's disclosure and the overall profile of block 86, the block is shaped to accommodate tubular light sources that extend along a length of block 86 (e.g., perpendicular to the plane of Figure 6). Surfaces 100 are shaped to allow tubular light sources to be mounted in proximity to block 86, and to direct rays emerging from such tubular light sources over a broad range of angles into block 86. The shape of block 86 – and surfaces 100 in particular – is not designed with a view to accommodating light-emitting diode sources.

Tatsuaki discloses display backlights that include, for example, a “cylindrically shaped fluorescent light 22 at the edge of a substantially rectangular light guide plate 21” (Tatsuaki, page 5, lines 25-26) as shown in Figure 4. With respect to Figures 13-17, Tatsuaki discloses that “[t]he corners of edge 40b, which is between edges 41b and 41b, and edge 40a, which is between edges 41a and 41d, are removed so that they do not stick out ... [and so] fluorescent light 62 can be installed with fixed gap 42 near edge 41, and the incident efficiency towards light guide plate 61 maintained at a high level” (id., page 10, lines 30-32). Therefore, the light sources disclosed by Tatsuaki are fluorescent lamps, and the modifications he makes to his light plates are expressly for the purpose of accommodating fluorescent lamps. There is simply no disclosure of light-emitting diodes sources in Tatsuaki.

Moreover, one of skill in the art at the time of the invention would not have been motivated to modify the teaching of Kalmanash and/or Tatsuaki to use light-emitting diode sources. As discussed above, the blocks and light plates disclosed by Kalmanash and Tatsuaki are specifically designed to accommodate elongated, tube-shaped fluorescent sources. Light-emitting diode sources are not typically elongated and tube-shaped, and the shapes of the blocks and light plates disclosed by Kalmanash and Tatsuaki are not optimized for such sources.

Previously pending claim 42 covered light source elements “wherein at least one light source is a semiconductor light-emitting diode.” In the Final Office Action mailed December 13, 2006, claim 42 stands rejected under 35 U.S.C. § 103(a) as allegedly obvious over a combination of Kalmanash, Tatsuaki, and Suzuki et al. (U.S. Patent No. 5,949,346, “Suzuki”). The Examiner alleges that “Suzuki ... teaches the use of at least one light source is a semiconductor light-emitting diode as a light source for low cost and good brightness.” (Action at page 14). The Examiner further alleges that it would have been obvious to modify the combination of

Kalmanash and Tatsuaki to use Suzuki's light-emitting diode "as a light source for low cost and good brightness." (Action at page 14).

Suzuki discloses that an object of his invention is to provide a low cost display device that can be applied to a liquid crystal display, and that includes light-emitting diode light sources. Suzuki does not disclose, however, that light-emitting diodes are of low cost, or that light emitting diodes are of lower cost than fluorescent lamps. To the contrary, at the time of the invention, light-emitting diodes were likely to be more expensive than fluorescent lamps.

Furthermore, Suzuki discloses that his display device should have "enough brightness" (Suzuki, col. 3, line 30). However, Suzuki does not quantify a threshold brightness that corresponds to "enough," nor does Suzuki disclose that light-emitting diodes provide greater brightness than fluorescent sources.

Accordingly, as discussed above, there would have been no motivation for one skilled in the art to use the light-emitting diodes disclosed by Suzuki in the backlights of either Kalmanash or Tatsuaki, because the blocks and light plates disclosed by Kalmanash and Tatsuaki are not adapted to use light-emitting diodes. Moreover, the reasons the Examiner proposes for combining Suzuki, Kalmanash, and Tatsuaki – namely, that Suzuki's light-emitting diodes are of low cost and provide good brightness – are not supported by Suzuki's disclosure. Instead, at the time of the invention, light-emitting diodes were more expensive than the fluorescent lamps disclosed by Kalmanash and Tatsuaki, and there is no evidence to suggest that the diodes provided any increase in brightness relative to fluorescent lamps. Thus, one skilled in the art would not have combined Kalmanash, Tatsuaki, and Suzuki in the manner proposed by the Examiner.

In view of the foregoing, Applicants ask that the application be allowed.

Canceled claims, if any, have been canceled without prejudice or disclaimer. Any circumstance in which Applicants have: (a) addressed certain comments of the Examiner does not mean that Applicants concede other comments of the Examiner; (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims; or (c) amended or canceled a claim does not mean that Applicants concede any of the Examiner's positions with respect to that claim or other claims.

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The fees in the amount of \$450.00 in extension fees are being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to Deposit Account No. 06-1050, referencing 12406-126001.

Respectfully submitted,

Date: _____

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